

# UNITED STATES PATENT OFFICE.

JOHN MATTHEW MOSS, OF PATRICROFT, COUNTY OF LANCASTER, ENGLAND.

## TRANSFERRING DESIGNS.

SPECIFICATION forming part of Letters Patent No. 272,575, dated February 20, 1883.

Application filed February 17, 1882. (No specimens.) Patented in England January 26, 1882, No. 388; in France February 9, 1882, No. 147,284, and in Austria May 20, 1882.

*To all whom it may concern:*

Be it known that I, JOHN MATTHEW MOSS, a subject of the Queen of Great Britain, residing at Patricroft, in the county of Lancaster, England, have invented certain new and useful Improvements in Transferring Designs to Surfaces, particularly useful (among many other applications) for the production of electrotypes and printing plates and rollers, (for which Letters Patent have been secured by me in Great Britain, No. 388, dated January 26, 1882; in France on the 9th day of February, 1882, No. 147,284, and in Austria on the 20th day of May, 1882;) and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same.

This invention has for its object improvements in transferring designs to surfaces, particularly useful (among many other applications) for the production of electrotypes and printing plates and rollers.

My invention relates to the production of etched, engraved, or electro-deposited surfaces on metallic and other suitable rollers and plates for printing and other purposes; and it consists of a new and improved method of transferring to such surfaces an exact copy of any picture, pattern, or design, in either printing, lithographic, or other suitable ink, oil, or varnish, to serve either as a guide to the engraver or as a resist for the etcher or electro-depositor.

In carrying out this my invention I proceed as follows: If the picture, pattern, or design be of such a nature as to be in all parts opaque and impervious to light, or if it differ in dimensions from the required etching, I first, by photographic or other means, take a copy of it the proper size upon either glass, gelatine, cloth, paper, or other transparent or semi-transparent material; but if the original design be already of the required size and upon such material and of such a nature that it can be used in the following manner, this is not required. The design or copy I then place in a photographic-printing frame or other similar apparatus, upon a sheet of paper, cloth, thin metal, or other tissue, (hereinafter spoken

of as gelatine-tissue,) which has been previously covered with a layer of gelatine, gum, starch, or other substance rendered sensitive to light by treatment with potassic bichromate, ammoniac chromate, or by other suitable means, and expose the whole to natural or artificial light in such a manner that the actinic rays can only reach the sensitive tissue by passing through the design. I prefer to employ fine calico thickly coated with gelatine and sensitized by immersion in a solution of bichromate of potash—say one part of the salt to five parts of water. In this I claim no novelty. The sensitive tissue having been thus exposed for a sufficient length of time, varying with the intensity of the illumination from five to thirty minutes or more, or until the parts of the gelatine-tissue to which light has had access are rendered insoluble in hot water, is then taken from the printing-frame and immersed in water having a temperature of about 60° Fahrenheit until the bichromate or other sensitive salt or substance is dissolved out, leaving the gelatine upon the tissue. This is then placed in a bath of warmer water, of from 70° to 90° Fahrenheit or more, and allowed to remain there to swell up the unchanged gelatine and form an image of the design in high relief. This being done, the tissue is taken from the bath, the excess of water removed by the application of blotting-paper, and it is then placed upon a smooth flat surface and allowed to dry sufficiently for the next operation.

For the next operation I require a plate of glass, stone, metal, or other suitable material having an accurately plane surface somewhat larger in every way than the gelatine-tissue. This I cover (using for the purpose a roller of gelatine or of india-rubber or by other suitable means) with a fine and even layer of printing, lithographic, or other suitable ink or varnish, preferring as the best a mixture of printing-ink and boiled linseed-oil. I then apply the gelatine-tissue, with the face carrying the relief downward, to this layer of ink, and press it gently and evenly down by means of a roller-scraper or other suitable instrument, repeating the operation, if necessary, until I find the parts in relief are well covered with a full coating of the ink or resist. The inked face of the



tissue I then apply to the surface (previously rendered perfectly clean and dry) intended to be etched or engraved or electro-deposited upon, whether it be that of a plate or a roller, pressing it in close and even contact by means of a roller, scraper, squeegee, or other suitable instrument, and leave it in contact for some little time.

In the case of the surface being that of a roller or cylinder I also adopt the following method: I place the inked tissue, inked face uppermost, upon a perfectly level and plane surface and slowly pass the cylinder over it, the weight of the latter, when it would be too great and exert an injurious pressure on the tissue, being reduced by levers and counterpoises properly applied. The roller takes up the tissue as it passes, and is at the same time pressed into good and even contact with it. After the lapse of a little time—say a minute or so—carefully raising the edge of the tissue, I strip it off with an even motion, leaving upon the metallic or other surface a perfect copy of the design in the ink or varnish which has been used. This may now either be allowed to dry, etched at once, or treated in the following manner: I take asphaltum pitch or other similar or suitable material or any mixture of the same, and reduce it to a very fine and impalpable powder. Placing this in a linen bag, fine sieve, or other suitable arrangement, I dust with it the surface carrying the design in the undried ink or varnish until it is covered with a fine layer of the impalpable powder. Then by means of a current of air or water suitably applied I blow or wash away all the powder from the parts of the surface not covered by the ink or varnish, and where of course it only lies loosely. I then heat the plate or roller until the powder retained melts into the ink or varnish, but not so much as to render it too liquid, and by running to injure the sharpness of the design. On allowing this to cool I obtain upon the surface a hard glossy resinous copy of the design, and it may then be engraved, etched, or electro-deposited upon in any way desired.

In some processes where a deep etching is required—the printing of calico or other textile fabrics, for example—it is necessary to give to the etched spaces what is known as a “ground,” to enable them to hold the requisite amount of color. This ground I obtain in the following manner: Having etched in the design but a small part of the depth ultimately required, I remove the plate or roller from the etching-bath, wash off all traces of the etching-liquor, and allow it to dry. Then I dust it as before, but only thinly, with the above-named powder, either fine or coarse, as the nature of the required ground may necessitate. I then, after heating the plate or roller, so as to cause the bituminous or resinous powder to adhere, again immerse it in the etching-bath and complete the etching to the required depth. The etching-liquor now only bites into the surface in the spaces between the granules of powder, and by using powders of suitable degrees of fineness and dusting them on more or less thinly any required ground may be obtained. The etching of the surfaces so treated may be done with either ferric chloride, nitric, hydrofluoric, or other acid or corrosive solution which may be used, varying with the nature of the plate or roller, which may be of either glass, metal, or any other material.

Having thus described the nature of my said invention and the manner of performing the same, I would have it understood that I claim—

The improved method of transferring designs, consisting in impressing the design upon a gelatine tissue by the action of light, afterward raising the unchanged portions by moisture, inking the portions so raised, while the changed parts are left without ink, and finally pressing the tissue upon the surface to which the design is to be transferred, substantially as described.

London, 31st January, 1882.

JOHN MATTHEW MOSS.

Witnesses:

JN. DEAN,

J. WATT,

Both of 17 Gracechurch St., London.